REMARKS

Claims 1-38 are currently pending in the subject application, and are presently under consideration. Claims 1, 13, 16, 29, 33 and 34 have been amended. Claims 1-38 are rejected. Favorable reconsideration of the application is requested in view of the amendments and comments herein.

I.   Rejection of Claims 1-38 under 35 U.S.C. 103(a)

Claims 1-38 have been rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,877,056 to Cypher ("Cypher") in view of U.S. Patent Pub. No. 2002/0129211 to Arimilli, et al. ("Arimilli") in further view of U.S. Patent No. 7,032,079 to Bauman, et al. ("Bauman"). Withdrawal of this rejection is respectfully requested for at least the following reasons.

Claim 1 has been amended to include some of the subject matter recited in claim 13, while claim 13 has been amended to maintain consistency with amended claim 1. Cypher taken in view of Arimilli and in further view of Bauman fails to teach or suggest a first node that defines a first processor and provides a broadcast request for data, the first node including a conflict state machine for managing non-data responses to the broadcast request for the data provided from the first node, the first node receiving a read conflict response to the broadcast request from the first node, the read conflict response indicating that a second node, which defines a second processor, has a pending broadcast read request for the data, the conflict state machine transitioning to a conflict state in response to the first node receiving the read conflict response, as recited in amended claim 1. In particular, the Office Action contends that the use of first node receiving a read conflict response to a broadcast request from the first node, which conflict response indicates that a second node has a pending broadcast read request for the data is well known based on the teachings of Arimilli (paragraphs [0026], [0032]. However, neither of these paragraphs teaches or suggests the use of a read conflict response as recited in claim 1. Instead, the combined response mentioned in these paragraphs [0026] and [0032] mentions a combined response, which informs an agent whether or not it won arbitration performed by a CDP and is the new owner of a target cache line. No response that indicates another node has a pending broadcast request for data is mentioned. Significantly, the approach disclosed in Arimilli relates to resolving conflict for ownership when there are multiple shared copies (See

Arimilli at paragraph [0028]). It is inherent that an agent with a shared copy would not issue a broadcast READ request for data, as appears to be suggested in the Office Action by its reliance on Arimilli.

Additionally, no process or structure in Cypher, Arimilli or Bauman (taken individually or in combination) corresponds to the conflict state machine, which is part of the first processor, as recited in amended claim 1. The Office Action admits that Cypher and Arimilli, taken individually or in combination, fails to teach or suggest any structure or process that can track the nature or type of non-data conflict responses, as does the conflict state machine recited in amended claim 1 (See Office Action, Page 3). In an attempt to make up for the deficiencies of Cypher and Arimilli, the Office Action has cited Bauman for Bauman's disclosure of a state machine that can detect and process a conflict between an address associated with a port memory write (PWM) request and an entry associated with an original read request (See Office Action, Page 3, Citing Col. 13, Lines 53-67 of Bauman).

In contrast to amended claim 1, Bauman relates to a main storage unit (MSU) 100 with a transaction tracker queue (TTQ) 204 that includes a state machine 206 for each request for data (See Bauman, FIG. 1, and Col. 8, Lines 34-38). However, Bauman discloses that the MSU 100 is the main memory for a data processing system (See Bauman, Col. 3, Lines 45-48). In contrast to the TTQ tracker 204 (that includes state machines 206) disclosed in Bauman, the first node (that includes a conflict state machine) recited in amended claim 1 defines a first processor. Nothing in Bauman or any other cited art (including Cypher and Arimilli) would teach or suggest that the TTQ tracker 204 disclosed in Bauman could be implemented in a processor, since the TTQ tracker 204 is implemented in the MSU 100, which provides the main system memory. Accordingly, Cypher taken in view of Arimilli and in further view of Bauman does not teach or suggest the system recited in amended claim 1, since none of the cited art teaches or suggests a first node that defines a first processor node, and the first node includes a conflict state machine for managing non-data responses to a broadcast request for data, as recited in amended claim 1.

Additionally, Cypher taken in view of Arimilli and in further view of Bauman fails to teach or suggest a third node that provides requested data to a first node in response to a broadcast request from the first node, the first node filling the data provided by the third node in a cache associated with the first node based on the state of the conflict state machine. As stated

above, none of Cypher, Arimilli and Bauman, taken individually or in combination, teaches or suggests employment of a conflict state machine as an element of a processor node. Thus, Cypher taken in view of Arimilli and in further view of Bauman cannot teach or suggest taking a particular action, such as filling data provided by the third node in a cache associated with the first node based on the state of the conflict state machine, as recited in amended claim 1. Accordingly, Cypher taken in view of Arimilli and in further view of Bauman fails to teach or suggest the system recited in amended claim 1, since Cypher taken in view of Arimilli and in further view of Bauman fails to teach or suggest a first node (that defines a first processor) includes a conflict state machine, as recited in amended claim 1. Therefore, for the reasons discussed above, Cypher taken in view of Arimilli and in further view of Bauman does not make amended claim 1 obvious such that amended claim 1, as well as claims 2-15 depending therefrom, is patentable over the cited art.

Additionally, Cypher taken in view of Arimilli and in further view of Bauman fails to teach or suggest that a broadcast request provided by a first node is broadcast using a first cache coherency protocol, the first cache coherency protocol being chosen by the first node based on the state of the conflict state machine, as recited in claim 7. As stated above with respect to amended claim 1, from which claim 7 depends, Cypher, Arimilli and Bauman, taken individually or in combination, fail to teach or suggest any process or structure that reads on a conflict state machine, as recited in amended claim 1. Thus, Cypher taken in view of Arimilli and in further view of Bauman cannot teach or suggest taking the particular action (e.g., choosing a first cache coherency protocol to resolve a transaction) based on a state of the conflict state machine, as recited in claim 7. While Cypher discloses both point-to-point and broadcast transmission modes, there is no evidence in Cypher, individually or in combination with the teachings of Arimilli and Bauman, that supports choosing any cache coherency protocol based on a state of conflict state machine. In fact all evidence in Cypher demonstrates that the decision whether to use the broadcast or point-to-point transmission is performed a priori based on querying a mode table 260 of a mode unit 250 based on the address of the requested cache line (See Cypher at Col. 7, lines 24-62, and FIG. 3). Accordingly, Cypher taken in view of Arimilli and in further view of Bauman fails to make claim 7 obvious since Cypher taken in view of Arimilli and in

further view of Bauman fails to teach or suggest a conflict state machine that is included in a processor node.

Furthermore, Cypher taken in view of Arimilli and in further view of Bauman fails to teach or suggest that a broadcast request provided from a first node is broadcast using a source broadcast cache coherency protocol, the broadcast cache coherency protocol being chosen by the first node based on a state of the conflict state machine, as recited in claim 12. For reasons similar to claim 7, Cypher taken in view of Arimilli and in further view of Bauman cannot teach or suggest the system recited in claim 12 since Cypher, Arimilli and Bauman, taken individually or in combination, fail to teach or suggest a conflict state machine included in a first node that defines a first processor node. Accordingly, Cypher taken in view of Arimilli and in further view of Bauman fails to make claim 12 obvious.

Claim 16 has been amended to make explicit that which was believed to be implicit. Additionally, claims 16 and 24 recite a conflict state machine (included with a first processor node) transitioning to a first conflict state of a plurality of conflict states if a first processor node receives a read conflict response, the conflict state machine transitioning to a second conflict state of the plurality of conflict states if the first processor node receives a second conflict response. For the reasons stated above with respect to amended claim 1, Cypher taken in view of Arimilli and in further view of Bauman fails to teach or suggest any structure or process that corresponds to a conflict state machine, as recited in amended claims 16 and 24. Additionally, since Cypher taken in view of Arimilli and in further view of Bauman fails to teach or suggest a conflict state machine in a processor node, Cypher taken in view of Arimilli and in further view of Bauman cannot teach or suggest that any particular action is taken, such as the first processor node being operative to implement a cache fill with data provided from a third node (or third processor, as recited in claim 24) if the conflict state machine transitions to a particular state (e.g., a first conflict state), as recited in claims 16 and 24.

Moreover, as discussed above with respect to amended claim 1, since Cypher, Arimilli and Bauman, taken individually or in combination, fail to teach or suggest any structure or process of a processor that can track and distinguish the nature of different types of conflict responses, as does the conflict state machine recited in claim 16 and 24, the approaches in the cited art cannot be combined to provide a system that operates to resolve a transaction in the

manner recited in claims 16 and 24. For these reasons, Cypher taken in view of Arimilli and in further view of Bauman fails to teach or suggest a multi-processor network, as recited in claim 16 or a computer system, as recited in claim 24. Accordingly, claims 16 and 24, as well as claims 17-23 and 25-28 depending therefrom, are patentable over the cited art.

Additionally, Cypher taken in view of Arimilli and in further view of Bauman does not teach or suggest a first processor node being operative to issue a request for data using a forward progress technique if the conflict state machine transitions to a second conflict state in response to the first processor node receiving the second conflict response, as recited in amended claims 17 and 25. For the reasons stated above with respect to claims 16 and 24, from which claims 17 and 25 respectively depend, Cypher taken in view of Arimilli and in further view of Bauman does not teach or suggest that any particular action is taken if a conflict state machine (included with a first processor node) transitions to a particular state (e.g., a second conflict state), as recited in amended claims 17 and 25. While Cypher discloses both point-to-point and broadcast transmission modes, there is no evidence in Cypher, individually or in combination with the teachings of Arimilli and Bauman, that supports choosing to employ a forward process technique based on the state of conflict state machine. In fact all evidence in Cypher demonstrates that the decision whether to use the broadcast or point-to-point transmission is based on what protocol is specified in a mode table 260 of a mode unit 250 for a given address of a target cache line (See Cypher at Col. 7, lines 24-62, and FIG. 3). Accordingly, Cypher taken in view of Arimilli and in further view of Bauman fails to make amended claims 17 and 25 obvious since Cypher taken in view of Arimilli and in further view of Bauman fails to teach or suggest a first processor node being operative to issue a request for the data using a forward progress technique if the conflict state machine transitions to a second conflict state in response to the first processor receiving a second conflict response, as recited in amended claims 17 and 25.

Furthermore, claims 18 and 26 recite a first processor node that is prevented from implementing a cache fill with data provided by a third node (or third processor, as recited in amended claim 26) if a conflict state machine transitions to a second conflict state in response to the first processor receiving a second conflict response. For the reasons stated above with respect to amended claims 17 and 25, Cypher taken in view of Arimilli and in further view of Bauman fails to teach or suggest the elements recited in claims 18 and 26 since Cypher taken in

view of Arimilli and in further view of Bauman fails to teach or suggest that any particular action is taken by a first processor node based on the state of a conflict state machine. Accordingly, Cypher taken in view of Arimilli and in further view of Bauman does not make claims 18 and 26 obvious.

Claim 29 has been amended to make explicit that which was believed to be implicit. Specifically, amended claim 29 recites means for providing a broadcast request for data from a first node that defines a first processor node includes means for managing non-data responses to the broadcast request and for transitioning among a plurality of conflict states in response to the non-data responses. For reasons similar to those discussed above with respect to claims 1, 16 and 24, Cypher taken in view of Arimilli and in further view of Bauman fails to teach or suggest means for managing non-data responses to a broadcast request and for transitioning among a plurality of conflict states in response to the non-data responses, as recited in amended claim 29. Moreover, amended claim 29 recites that the means for managing non-data responses transitions to a conflict state according to a highest priority non-data response that is received by the provider of the broadcast request. Thus, in contrast to the approaches taught by Cypher taken in view of Arimilli and in further view of Bauman, the conflict state in amended claim 29 is explicitly determined by the priority of a non-data response to allow certain action (e.g., placing data from the third node in the requestor's cache) to occur based on the particular conflict state.

Furthermore, since Cypher taken in view of Arimilli and in further view of Bauman fails to teach or suggest means for managing non-data responses to a broadcast request and for transitioning among a plurality of conflict states in response to the non-data responses, as recited in amended claim 29, Cypher taken in view of Arimilli and in further view of Bauman cannot teach or suggest means for placing the data from a third node in a cache associated with the first node in response to a read conflict response from a second node causing the means for managing non-data responses to transition to a conflict state, as recited in amended claim 29. For these reasons, Cypher taken in view of Arimilli and in further view of Bauman does not make the system recited in amended claim 29 obvious. Accordingly, amended claim 29, as well as claims 30-33 depending therefrom, is patentable over the cited art.

Claim 34 has been amended to make explicit that which was believed to be implicit. Specifically, claim 34 has been amended to recite transitioning a state of a conflict state machine

included with a first node (that defines a first processor node) based on a read conflict response being a highest priority non-data response that is received by the first node. For the reasons similar to those discussed above with respect to amended claim 1, Cypher taken in view of Arimilli and in further view of Bauman fails to teach or suggest transitioning a state of a conflict state machine included with a first node that defines a first processor node, as recited in amended claim 34. Additionally, since Cypher taken in view of Arimilli and in further view of Bauman fails to teach or suggest transitioning a state of a conflict state machine included with a first node that defines a first processor node, Cypher taken in view of Arimilli and in further view of Bauman fails to teach or suggest placing the data provided by a third node in a cache associated with the first node based on the state of the conflict state machine, as recited in amended claim 34. For these reasons, Cypher taken in view of Arimilli and in further view of Bauman fails to make amended claim 34 obvious. Thus, amended claim 34, as well as claims 35-37 depending therefrom, is patentable over the cited art.

Regarding claim 38, for the reasons stated above with respect to amended claims 1, 16, 24 and 29, Cypher taken in view of Arimilli and in further view of Bauman fails to teach or suggest a computer system, as recited in claim 38. In particular, claim 38 recites a hybrid cache coherency protocol that can choose a particular protocol (e.g., a source broadcast protocol or a forward broadcast protocol) based on the nature of source broadcast conflict responses in the computer system. Significantly, no node, as taught by Cypher, Arimilli and Bauman includes any structure or process that can choose a protocol based on the nature and priority of a conflict, as does the computer system recited in claim 38.

In rejecting claim 38, the Office Action contends that Cypher discloses all of the elements of claim 38 (See Office Action, Pages 20-21, citing Col. 27, Lines 12-33 and 55-67 of Cypher). Nothing in the cited section of Cypher (or Cypher more generally) appears to be related to any choosing of a protocol based on the nature and priority of a conflict, as does the computer system recited in claim 38. Consequently, the approaches taught in Cypher, Arimilli and Bauman can not operate (individually or in combination) to resolve a transaction in the manner recited in claim 38. Accordingly, Applicant's representative respectfully submits that Cypher taken in view of Arimilli and in further view of Bauman fails to make claim 38 obvious, and claim 38 is patentable over the cited art.

II.   CONCLUSION

In view of the foregoing remarks, Applicant respectfully submits that the present application is in condition for allowance. Applicant respectfully requests reconsideration of this application and that the application be passed to issue.

Should the Examiner have any questions concerning this paper, the Examiner is invited and encouraged to contact Applicant's undersigned attorney at (216) 621-2234, Ext. 106.

No additional fees should be due for this response. In the event any fees are due in connection with the filing of this document, the Commissioner is authorized to charge those fees to Deposit Account No. 08-2025.

I hereby certify that this correspondence is being transmitted to the U.S. Patent and Trademark Office via electronic filing on December 6, 2007.

Respectfully submitted,

/Gary J Pitzer/

CUSTOMER NO.: 022879

Hewlett-Packard Company
Legal Department MS 79
3404 E. Harmony Road
Ft. Collins, CO 80528

Gary J. Pitzer
Registration No. 39,334
Attorney for Applicant(s)